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Author(s): Pam Scholder Ellen and Paula Fitzgerald Bone

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# Does It Matter If It Smells? Olfactory Stimuli As Advertising Executional Cues

Pam Scholder Ellen and Paula Fitzgerald Bone

*Despite the limited empirical evidence about the effectiveness of olfactory cues in advertising, firms are increasingly using such cues in their advertisements. The authors examine the effects of olfactory cues that are used as a novelty, as opposed to a product sample, on consumer attitudes. The results show that the addition of a more congruent scratch-and-sniff panel to an advertisement improves neither attitude toward the ad nor attitude toward the brand. Further, the addition of a poorer-fitting scent actually lowers attitudes among individuals who are more motivated to process. Those results appear to be a function of the mood evoked by the scented advertisement and of the scent's perceived pleasantness in the advertising context.*

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**Pam Scholder Ellen** (Ph.D., University of South Carolina) is Associate Professor of Marketing, Georgia State University.

**Paula Fitzgerald Bone** (Ph.D., University of South Carolina) is Associate Professor of Marketing, West Virginia University.

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Executional cues have been the focus of much advertising research. Visual cues (pictures) and aural cues (music) have been studied extensively, yet virtually no attention has been paid to the influence of olfactory cues in advertising despite the growing trend among advertisers to use scents in ads. Scents often have been used in advertisements for products in which scent is a primary attribute (e.g., perfumes, room fresheners) and, when used in that context, are a form of sampling. However, scents have also been used for products for which scent has been considered largely irrelevant. For instance, Tanqueray gin ran a pine-scented ad in *USA Today*, Rolls Royce advertised its cars in *Architectural Digest* using leather-scented strips, and the State of Utah used floral- and spice-scented panels in a four-page tourism ad. Though such uses may be intended simply as novelties, research suggests that odors can influence mood state (Baron 1990; Ehrlichman and Bastone 1992; Knasko 1992) and affect judgment (Baron 1990; Bone and Jantrania 1992; Spangenberg, Crowley and Henderson 1996). Therefore, the use of scents in advertising warrants attention.

Odors differ in several ways from the pictures and sounds more familiar to advertising researchers. Compared to visual and aural cues, odors are difficult to recognize, are relatively difficult to label, may produce false alarms and create placebo effects. Schab (1991), in a review of the literature, concluded that the ability to attach a name to a particular odor is so limited that individuals, on average, can identify only 40% to 50% of odors in a battery of common odors. Additionally, consumer ability to detect and recognize odors is influenced by surrounding cues (Davis 1981). For example, a consumer is more likely to recognize a lemon scent when the scent is contained in a yellow liquid than when it is contained in a red liquid. Third, false alarms, perceiving an odor when in reality no odor is present, are relatively common (Engen 1972). Finally, researchers have shown that both emotional and physical states can be affected just by *believing* an odor is present. The odorant itself need not be present (Knasko, Gilbert, and Sabini 1990). That finding suggests placebo effects.

Despite the difficulties, olfactory cues hold appeal to advertisers working in an already cluttered environment. Olfactory responses are primarily autonomic, affecting a person physiologically before affecting cognition. Odors stimulate the limbic system, the part of the brain responsible for emotional responses. Thus, olfaction represents a different path to the consumer than is afforded by other types of cues.

We examined a consumer-controlled odor delivery system (scratch-and-sniff panels) as opposed to ambient systems to (1) explore the usefulness of olfactory stimuli as an executional cue in influencing attitude toward the ad (Aad) and attitude toward the brand (Ab), (2) determine whether those effects are moderated by motivation to process and cue fit, and (3) examine the mediators of processes that may underlie olfactory cue effects (i.e., mood, hedonic transfer of scent pleasantness, and cognitions).

### **Mediators: Why Odors May Influence Attitudes**

More than 60 years ago, Laird (1932) found evidence that olfactory cues could affect consumer judgments. His investigation showed that women's judgments about hosiery quality were influenced significantly by the addition of an unrelated scent. More recently, Bone and Jantrania (1992) found that odors that "fit" the product (such as lemon scent for a household cleaning solution) improved product evaluations. Additionally, using a simulated retailing environment, Spangenberg, Crowley, and Henderson (1996) found that store evaluations, and one of three different product evaluations, were improved when a "non-offensive" ambient odor was present. The ability to affect consumer judgments may be a function of several possible mediators: mood, hedonic transfer of perceived pleasantness, and cognition.

#### **Mood State**

One of the most common findings in olfactory research is that pleasant scents create pleasant mood states (Ehrlichman and Bastone 1992). Certain odors (e.g., nutmeg, lavender) have been shown to create relaxed mood states whereas others (e.g., jasmine, peppermint) evoke stimulated or activated moods (Parasuraman 1984; Torii et al. 1988). In turn, research has shown that a positive or negative mood state colors one's judgments of, or can be transferred to, unrelated focal objects (cf. Isen and Shalker 1982; Petty et al. 1993). Those findings suggest that a pleasant scent accompanying an advertisement may improve Aad and Ab through a mood shift.

#### **Hedonic Transfer of Scent Pleasantness**

Odor effects also may occur in the absence of a mood shift (Cann and Ross 1989; Ehrlichman and Halpern 1988; Knasko 1992; Spangenberg, Crowley, and Henderson 1996). Consumers perceive the pri-

mary dimension of an odor to be its pleasantness, so much so that most consumers have difficulty describing an odor in any way beyond whether or not it is pleasant (Henion 1971; Richardson and Zucco 1989). Those findings suggest that odors may influence attitudes through a transfer or "sharing" of hedonic tone (Ehrlichman and Halpern 1988); that is, because the odors are pleasant or unpleasant, associated objects are also perceived to be pleasant or unpleasant. The consumer does not experience a mood shift; there is simply the sharing of pleasantness/unpleasantness or goodness/badness.

#### **Cognition**

Odors are often tied to specific objects, events, and people in the consumer's long-term memory. In fact, an odor's effect may vary dramatically among individuals, depending on their cognitive associations with that odor. For example, though some people may find the scent of cigar smoke unpleasant, it may evoke in others pleasant memories of a specific cigar smoker (Engen 1972).

According to Kirk-Smith and Booth (1987), emotional responses to an odor depend on "the complex meaning of previous social experience with odors" (p. 159); that is, odors have personal meanings based on the person, place, or thing with which the odor is associated. Kirk-Smith (1994) argues that reactions to odors are based on associations and knowledge such that the "response to these odours will depend on circumstances and contexts, and these cannot be easily specified" (p. 391).

Hence, an odor may influence consumers' attitudes through the associations it evokes. That activation may, in turn, lead the consumer to direct more resources to the odor's source and influence the processing of other information.

Prior research leads to the following hypothesis.

H1: Using scent in an advertisement can influence attitudes (a) by altering mood state, (b) through hedonic transfer of the perceived scent pleasantness, or (c) by stimulating cognitive elaboration

We next turn to identifying when olfaction effects may occur.

#### **Moderators: The Role of Motivation to Process and Cue Fit**

##### **Motivation to Process**

The Elaboration Likelihood Model (ELM; Petty and Cacioppo 1986) states that an advertising element can affect attitudes in either of two basic ways. First,

an ad element may be viewed by the consumer as a message argument—providing information to the consumer about the product or service. Alternatively, the element may be used as a peripheral cue—a nonmessage element that does not provide information about the ad product, but evokes positive feelings.

Miniard et al. (1991) examined the influence of pictures on consumer attitudes and found that, as motivation to process increased, pictures relevant to the target product had greater influence on the consumer than pictures that were irrelevant. Hence, on the basis of their research, we would expect product-relevant odors to be more influential for consumers who are more motivated to process than for those who are less motivated to process.

When consumers are less motivated, the odor may work in a different way. For such consumers, Miniard et al. (1991) found that product-irrelevant pictorial cues had a greater effect on attitudes than product-relevant cues. One should note, however, that olfactory cues can potentially operate very differently than the pictures used in other "advertising element" studies. For example, Miniard et al. (1991) used pictures of palm trees, iguanas, orange slices, and puppies for their executional cue stimuli, objects that most individuals can easily recognize and label. Odors, in contrast, are more difficult to recognize and label. Perhaps odor effects are more influential on more highly motivated consumers, than on less motivated consumers because the former are willing to allocate resources needed to identify the odor. Note that odor identification is not a *necessary condition* for odor effects to occur. In fact, though individuals may have difficulty naming an odor, often they are aware that they know the smell. Lawless and Engen (1977) call that phenomenon, the "tip-of-the-nose state." (It is similar to tip-of-the-tongue state in which a person knows the word, but just cannot recall it.)

### Cue Fit

Cue fit is the consumer's perception of how relevant or appropriate one cue is to the other ad components, including both cogent message elements and nonverbal components (cf. MacInnis and Park 1991). Cue fit can be determined by careful reading of the advertising copy or by a quick comparison with the product advertised, pictorial cues, or the advertisement's headline. Though consumers may not be able to identify a scent specifically, they may be able to determine that the scent is "just not right."

Logically, executional cues would be selected to complement other elements of the ad. For example,

Bone and Jantrania (1992) found that a product with a scent typical for the product category (a suntan lotion with a coconut scent) was evaluated more positively than a product with a scent atypical for the product (a suntan lotion with a lemon scent). However, from the earlier anecdotes, it is apparent that some advertisers choose scents that are not consistent or expected. In fact, Spangenberg, Crowley, and Henderson (1996) caution retail store managers "to choose a scent that cannot be construed as either consistent or inconsistent with any single product or category." (p. 78). Clearly, the issue warrants attention.

When the cue is consistent with the consumer's expectations or schema, he or she should respond with "a primitive positive evaluation" (Mandler 1982, p. 13). When information is incongruent and disrupts the consumer's expectations, Mandler predicts that "such arousal sets the stage for emotional experiences" (p.14.) For instance, consumers may have a general expectancy (i.e., a schema in Mandler's terms) for odorants used in advertising. That schema could include the general rule that "the odor used in the ad will be the odor of the object shown in the picture." Hence, a consumer seeing an ad about lemon-scented detergent would expect the accompanying scent strip to hold a lemon scent. If instead the consumer were exposed to a mint scent, it could lead to a violation of the schema and negative affect or alternatively influence the processing of the advertisement's message elements. Either mechanism could lead to an effect on Aad. Petty et al. (1993) suggest that the latter effect is particularly likely when an individual is more highly motivated to process the advertisement's claims. Therefore, we might expect a highly motivated consumer to be "bothered" when the odor used for the advertisement does not seem to be related to the ad. That discrepancy could lead to more careful attention to the ad, could create less positive affect because the odor is judged "inappropriate," and could result in less positive attitudes toward the ad and product.

The preceding discussion leads to three hypotheses.

- H2: The interaction between motivation to process and scent fit is such that individuals who are more motivated are more influenced by a scent than individuals who are less motivated to process.
- H3: When individuals have low motivation to process, the effect of an olfactory cue may be attenuated because of inability to identify the odorant.
- H4: The attitudes resulting from olfactory cues may be due to negative affect created by the lack of fit, positive affect re-

sulting from the addition of a pleasant odor to the ad, a less positive perceived pleasantness rating due to lack of scent fit, or differences in cognitive processing.

### **Method**

Two hundred and thirty-nine adult female employees of a major university were recruited by letter to participate in an advertising study in return for a donation to a charitable organization. The study was limited to women because of differences in how the sexes perceive and use olfactory stimuli (Cain 1982; Doty et al. 1985). Women apparently have heightened sensitivity to smell and greater ability to label odors than men. The typical respondent was 25 to 34 years of age, married, had some college education, and reported a household income of \$15,000 to \$24,999.

A four-color full-page scented ad for a fictitious travel destination (i.e., Brooksville) was created for the research. The ad was based on an advertisement used by the State of Utah in which floral and spice scratch-and-sniff panels accompanied pictures of landscapes. The headline of the ad read, "The Fragrant Memories of Brooksville Linger Long After Your Visit." A large color photo of pink wildflowers was placed in the center of the advertisement. A scratch-and-sniff panel labeled in reversed type (i.e., white type on color background) was prominent in the lower right quadrant of the picture in the scent conditions. Commercial scents were applied by a printer specializing in scented materials. Under the picture, several paragraphs of copy detailed the activities (e.g., biking, dancing on a riverboat) and attractions (e.g., mountains, a blueberry festival, a historic district) available to the traveler.

A two (motivation to process) by four (scent condition) design was used. Motivation to process was manipulated by having subjects focus their attention on either the target ad for Brooksville or a Rockports walking shoe ad (cf. Andrews et al. 1992). Specifically, subjects were asked to pay close attention to one of the two ads and to assume that they would have to decide whether to purchase.

The four scent conditions included (1) a more consistent cue manipulation (a scratch-and-sniff panel with a floral scent consistent with the floral photo), (2) a less consistent cue manipulation (a scratch-and-sniff panel with a pine scent inconsistent with the floral photo), (3) a placebo manipulation (a scratch-and-sniff panel with no scent) and (4) a control ad with no scratch-and-sniff panel or scent.

The floral scent was the better fit with the advertisement as the focal picture was of flowers and the

copy began, "Time slows as you experience the beauty of wildflower meadows." The pine scent was a poorer fit with the picture and pine was not mentioned in the advertising copy. The two control conditions enabled us to take into account the physical activity of scratching and sniffing and to compare a cue-present with cue-absent condition.

### **Procedures**

The study was conducted in groups of three to seven in a modified classroom. Within each group, subjects were assigned randomly to one of the eight experimental conditions. However, individuals in the no-scent-panel control were run separately so they would not see other subjects scratching and sniffing an ad. The experimenters were trained in procedures but were blind to individual treatment conditions.

After completing a consent form, subjects were asked to examine each of 10 four-color full-page ads at their own pace but to pay particular attention to either the Brooksville or Rockports ad (i.e., the motivation-to-process manipulation). The experimental ad was placed sixth in the series. After examining the entire booklet, subjects exposed to an ad with a scratch-and-sniff panel completed aided and unaided recall measures along with measures of mood, Aad and Ab. They also indicated whether they had noticed that the ad had a scratch-and-sniff panel and whether they had smelled the panel. If subjects indicated that they had smelled the ad, they were asked to identify the scent and provide evaluations of the scent's pleasantness and "fit" with the overall ad. Subjects also completed items as a manipulation check of motivation to process. Subjects in the control condition (without a scratch-and-sniff panel) completed all items but those pertaining to the scratch-and-sniff panel and the odor used. All subjects then were debriefed.

### **Manipulation Check Measures**

**Scent Fit.** Five Likert-type items similar to those of MacInnis and Park (1991) were used to assess scent fit. Subjects were asked the extent to which they either agreed with statements such as or agreed with statements such as the following. "The scent for the advertisement was consistent with what was in the ad" and "It is clear to me that the scent was related to what was in the ad." Two of the scales were 9-point scales and the other three were 5-point scales; hence the items were standardized and then summed, providing a reliable indicator of scent fit ( $\alpha=.89$ ).

**Motivation to Process.** Motivation to process was assessed by self-reported cognitive effort, that is, the outcome of the motivation to process (Petty and Cacioppo 1986). Subjects used a "very much" to "not at all" response scale to report the extent to which they tried to evaluate the information in the target ad and indicated the effort they put into evaluating the information in the target ad on a scale of "a great deal of effort" to "no effort at all." They also indicated the degree to which they agreed with statements such as, "I paid close attention to the Brooksville advertisement" and "I carefully read the copy in the Brooksville advertisement." The sum of the four 9-point items was used ( $\alpha=.93$ ).

### **Mediator Measures**

**Scent Pleasantness.** Only subjects who actually scratched and sniffed the ad completed the scent pleasantness items. We measured the construct by using the sum of three 9-point semantic differential items: agreeable/disagreeable, pleasant/unpleasant, and good/bad ( $\alpha=.96$ ).

**Mood.** Mood evoked by the Brooksville ad was assessed by using the sum of six 9-point semantic differential items, similar to Mehrabian and Russell's (1974). Items included were satisfied/unsatisfied, happy/unhappy, hopeful/despairing, wide-awake/sleepy, aroused/unaroused, and pleased/annoyed ( $\alpha=.89$ ).

**Cognitive Elaboration.** Several measures of cognitive elaboration were used. First, recall of ad claims was measured by the number of correct claims or reasonable inferences recalled by the subjects. Several phases of unaided and aided recall were used to derive those measures. In the unaided recall section of the questionnaire, subjects were asked to list any ads or the products/brands advertised that they remembered. For each one recalled, they were asked to list statements or claims made in the ad. For each of the next levels, respondents were prompted by asking whether they recalled any travel ads and subsequently any ads for a vacation spot in the target state. The number of correct claims across these levels was counted. There was no double counting; that is, a claim was counted only once even if the respondent stated the claim in more than one place. Correct claims included anything that was in the ad text or the visual elements. Synonyms for claims or ad elements were also included as correct. The number of reasonable inferences included claims that were not stated directly in the ad, but would be reasonable to infer from the copy or visual elements used in the ad. For example, "get lots of fresh air" was considered a reasonable inference given the number of outdoor

activities listed. Again, there was no double counting. Coding was completed by a trained coder who was blind to the experimental condition. The number of correct statements and number of reasonable inferences were summed to provide a measure of ad recall.

As a second measure of cognitive activity, subjects were asked, "Assume that a friend has asked you what you know about Brooksville. In the following boxes, list everything you can think of to tell them about Brooksville." All comments were counted. Later, subjects self-coded their comments as positive, negative, or neutral. (The number of negative ad claims is not analyzed as a part of the cognitive processing as only 10 individuals reported any negative thoughts.) The number of positive thoughts and number of neutral thoughts were each divided by the total number of thoughts (i.e., number of positive, neutral, and negative thoughts) reported in the section to yield the percentage of support arguments and the percentage of neutral thoughts.

The final cognitive measure explicitly examined whether the scent activated links to other information stored in long-term memory. Two 5-point items were used: "The scent made me think about other experiences in my life" and "I was reminded of other people, places, or things by the scent in the ad." Those items were summed ( $\alpha=.83$ ) as an indicator of the links to long-term memory activated.

### **Dependent Variable Measures**

**Attitude toward the Ad.** Aad was measured as the sum of six 7-point semantic differential items: interesting/not interesting, good/bad, likable/not likable, not irritating/irritating, pleasant/unpleasant, and enjoyable/not enjoyable (Madden, Allen, and Twible 1988). Coefficient alpha for the items is .93.

**Attitude toward the Brand.** Subjects were asked to give their opinion about visiting Brooksville by using four 7-point semantic differential items: good/bad, wise/foolish, favorable/unfavorable, and beneficial/harmful (Ajzen and Fishbein 1980). Additionally, they were asked to indicate on an 11-point scale the extent to which they agreed with the statement, "Brooksville would be a good place to go on vacation." The items were standardized and summed ( $\alpha=.91$ ).

## **Results**

### **Manipulation Checks**

Cell means for the manipulation checks are reported in Table 1. To test the effectiveness of the motivation-

**Table 1**  
**Cell Means and Standard Deviations**

<i>Manipulation Checks</i>	<i>Mean</i>	<i>SD</i>	<i>n</i>
<i>Motivation to Process</i>			
Lower	18.43	7.83	103
Higher	28.54	5.44	109
<i>Cue Fit</i>			
Floral scent	2.33	2.93	41
Pine scent	-1.13	4.17	42
Unscented panel	-.61	4.02	25
<i>Motivation to Process</i>			
<i>Dependent Variables</i>	<i>Lower</i>		<i>Higher</i>
	<i>Mean</i>	<i>SD</i>	<i>n</i>
<i>Attitude toward the Ad</i>			
Floral scent	32.35	6.08	17
Pine scent	30.00	6.59	18
Unscented panel	34.89	5.71	9
No panel	29.73	7.98	26
<i>Attitude toward the Brand</i>			
Floral scent	.42	3.59	17
Pine scent	-1.40	3.80	18
Unscented panel	2.53	3.58	9
No panel	.02	3.68	26

to-process manipulation, we analyzed data from all subjects by using an ANOVA model in which the motivation-to-process measures were the dependent variable and the motivation and scent treatments were the independent variables. Motivation-to-process scores were affected by the motivation treatment ( $F=117.92$ ,  $p<.01$ ,  $\eta^2=.36$ ). Specifically, subjects in the higher motivation treatment reported greater effort than those in the lower motivation treatment. We found no main effect for the scent treatment or interaction (both  $p$ 's>.33).

The effectiveness of the scent fit manipulation was tested only with data from individuals who had scratched and sniffed the panel (approximately 75% of the subjects exposed to the floral- and pine-scented ads and roughly half of those in the unscented panel condition). An ANOVA model with the scent fit measure as the dependent variable and the scent and motivation treatments as the independent variables showed a main effect for scent on scent fit ( $F=9.79$ ,  $p<.01$ ,  $\eta^2=.16$ ). Subjects in the floral-scent treatment

reported better fit between the ad and the odor than those in the pine and the no-scent treatments. We found no differences between pine and no scent and no main or interaction effects for the motivation manipulation on perceived scent fit (both  $p$ 's>.24).

### **Tests of Moderating Effects**

A series of MANOVA and MANCOVA models were used to test the potential moderating effects of motivation to process and scent fit. Table 1 reports the cell means and Tables 2 and 3 report the results of the statistical tests. Unless otherwise noted, we analyzed only cases in which the individuals had scratched and sniffed the ad.

H2 posits an interaction between motivation to process and scent fit, specifically that individuals who are more motivated to process will be more influenced by a scent than individuals who are less motivated. A MANOVA model in which Aad and Ab were the dependent variables and scent fit and motivation

**Table 2**  
**Effects of Motivation to Process and Cue Fit on Aad and Ab**

	<i>Motivation to Process</i>			<i>Cue Fit</i>			<i>Motivation Cue Fit</i>		
	<i>Wilks' Lambda</i>	<i>F</i>	<i>p-Value</i>	<i>Wilks' Lambda</i>	<i>F</i>	<i>p-Value</i>	<i>Wilks' Lambda</i>	<i>F</i>	<i>p-Value</i>
Overall Model	.99	.01	.99	.89	3.02	.01	.89	2.82	.01
	<i>F</i>	<i>p-value</i>	$\eta^2$	<i>F</i>	<i>p-value</i>	$\eta^2$	<i>F</i>	<i>p-value</i>	$\eta^2$
Univariate for Aad	—	—	—	6.25	.01	.11	2.61	.05	.05
Univariate for Ab	—	—	—	3.70	.01	.07	.97	.41	.02
Roy-Bargman Stepdown For Ab	—	—	—	.02	.99	—	—	—	—

to process were the independent variables showed an interaction as well as a main effect due to scent. We found no main effect for motivation to process. The Roy-Bargman stepdown F, reported in Table 2, indicates that the observed effects are captured by Aad; in other words, there are no direct effects of scent fit or motivation on Ab. The remaining analyses were conducted only with Aad.

For the subjects in the lower motivation condition, we found no difference between the Aad cell means ( $F=1.64$ ,  $p=.19$ ). However, in the higher motivation treatment, there were differences ( $F=7.35$ ,  $p=.01$ ; see Table 1.) Specifically, attitudes toward the ad in the floral-scent, no-scent, and no-panel manipulations were equivalent, and each higher than Aad in the pine-scent group.

### Tests of Mediating Effects

We now examine why the effects on Aad were found in the more highly motivated group and not the less motivated group. Several variables could mediate the relationship between scent and Aad. H3 suggests that when individuals have lower motivation to process, the effect of an olfactory cue may be attenuated because of the inability to identify the odorant. Under lower motivation to process, 76% of the subjects correctly identified the floral scent, only 11% correctly identified the pine scent, and only one person in the no-scent condition correctly reported that there was no scent. (Interestingly, 61% of subjects smelling pine and 30% of those in the no-scent condition stated that the odor was floral.) A chi-square goodness-of-fit test shows differences ( $\chi^2=16.64$ ,  $p<.01$ ) in ability to identify the odors correctly.

In the higher motivation conditions, the chi-square goodness-of-fit test also shows differences in the percentage correctly identifying the odorants ( $\chi^2=6.70$ ,  $p=.04$ ). Respondents appear to have been more accurate in labeling in the pine and the no-scent conditions. Specifically, 70% correctly identified the floral scent, 26% correctly identified pine, and 57% correctly identified no scent. T-tests of proportions were used to compare the percentage correct in the high and low motivation conditions. The percentage correct was different only in the no-scent conditions ( $t=2.35$ ,  $p=.02$ ). H3 is not supported as no differences were found in the ability to identify the two odors used—the only difference was in the placebo condition. A t-test of proportions did indicate that the percentage of subjects receiving the pine scent but misidentifying it as floral was lower in the higher (26.3%) than in the lower motivation condition (61.1%) ( $t=2.14$ , d.f. = 35,  $p<.05$ ).

H1 and H4 identify several potential mediator variables: positive mood, scent pleasantness, cognitive processing (operationalized as number of claims recalled, percentage of positive thoughts or support arguments, percentage of neutral thoughts, and cognitive links to long-term memory). We used only the higher motivation group to examine the influence of those mediators as only those subjects were affected by the scent treatment. For each mediator, a separate MANOVA model was run and compared with the no-covariate model in which Aad was the dependent variable and the three cue-fit manipulations (floral, pine, and no-scent control) were the independent variables. The results are reported in Table 3.

Four of the covariates were significant and reduced the amount of variance explained by the cue-fit ma-

**Table 3**  
**Mediator Effects on Aad In Higher Motivation Conditions**

	Regression		Covariate				Scent Main Effect		
	F	p-value	Beta	t-value	p-value	$\eta^2$	F	p-value	$\eta^2$
<i>Baseline Model (No Covariates)</i>							12.35	<.01	.32
<i>Model for Each Covariates</i>									
Positive mood	59.43	<.01	.74	7.71	<.01	.55	9.06	<.01	.27
Scent pleasantness	11.21	<.01	.43	3.35	<.01	.19	5.69	<.01	.19
Recall	.74	.39	-.12	-.86	.39	—	12.55	<.01	.33
Support arguments (%)	12.88	<.01	.46	3.59	<.01	.21	9.93	<.01	.29
Neutral thoughts (%)	9.26	<.01	-.40	-3.04	<.01	.16	9.46	<.01	.28
Cognitive links	.68	.41	.12	.82	.41	—	11.05	<.01	.31
<i>Final Mediated Model</i>	25.16	<.01					4.69	.01	.17
Positive mood			.71	6.32	<.01	.47			
Scent pleasantness			.28	2.96	<.01	.16			

nipulation. The base model resulted in a scent effect size ( $\eta^2$ ) of .32. Positive mood, scent pleasantness, percentage of support arguments, and percentage of neutral thoughts were significant mediators, with reductions of 5%, 13%, 3%, and 4% of  $\eta^2$ , respectively. In each of those models, scent still had an effect on Aad after controlling for the covariate.

The preceding analyses provide preliminary evidence of the factors driving the observed cue-fit effects, but what happens when all of those mediators are included in the MANCOVA model? The results in Table 3 indicate that the primary mediators of the scent effects are positive mood and perceived scent pleasantness. Once those two mediators are accounted for, the overall explained variance for the cue-fit manipulation drops from 32% to 17%, yet the scent factor remains significant.

The analysis supports the proposition that scent can influence mood state, which in turn affects Aad. Additionally, there appears to be an effect of perceived scent pleasantness, such that the more pleasant the scent is perceived to be, the more positive the attitude toward the ad; that is, we find evidence of a hedonic transfer of the scent. H1 and H4 therefore are partially supported.

## Discussion and Conclusion

We examined the effect of olfactory cues in advertisements where the odor is not the primary characteristic of the product or service. Specifically, the olfactory cue and its delivery mechanism, the scratch-

and-sniff panel, provided supplemental information or novelty. The results indicate that the panels had the greatest effect on attitudes toward an advertisement, and consequently toward the brand, when individuals were more motivated to process and when the cue was less fitting to consumers' expectations. The observed effect was negative; the cue that "broke" with expectations led to more negative attitudes in the higher motivated group whereas the more consistent cues failed to enhance attitudes. The best explanation seems to be that the scent in the better-cue-fit condition added no new information (i.e., met expectations of smelling like flowers) whereas the unexpected pine scent in the poorer-cue-fit condition created negative affect. The failure to improve attitudes might cast doubt on the wisdom of using a relevant odor in an advertisement because doing so entails greater cost and a more complex production process. However, if the cue itself provided additional information (i.e., was the central product offering such as an air freshener or an additional attribute of a product such as a scented bleach), we might observe an effect in the better-cue-fit condition.

One of our research goals was to understand the means by which the olfactory cues might affect attitudes. Specifically, we examined the mediating effects of mood, perceived scent pleasantness, and cognitions for respondents with higher motivation to process. A better-fitting scent or even a no-scent ad did not improve mood, but the poorer-fitting scent negatively affected the individual's mood state and subsequently Aad. Perceived scent pleasantness was greater

in the floral and no-scent conditions and again affected Aad positively. We observed no cognitive effects as measured by recall, percentage of positive or neutral thoughts, or cognitive links.

One question raised by the results of our experiment was whether the poorer-fitting pine scent used was simply less pleasant than the floral scent, leading to a confound between actual scent pleasantness and scent fit. Several factors led us to conclude that there was not a confound. First, one could argue on the basis of offerings in the marketplace that both scents are indeed pleasant—many aromatherapy oils as well as products used to scent cars and homes are offered in both pine and florals versions. Spangenberg, Crowley, and Henderson's (1996) work on ambient odors confirmed that both types of odors are perceived as pleasant. In pretests, they tested four floral odors (lavender, ylang ylang, blue chamomile, and geranium) and a pine scent. All five scents loaded negatively (florals ranging from -.26 to -.78 and the pine -.72) on the affective dimension score, indicating that pine and floral have approximately the same level of perceived pleasantness. (Only scents that were at least "non-offensive" were used; hence, the negative loadings do not imply a foul smell.)

Additionally, we conducted a post-test using the commercially prepared microencapsulated odors to determine whether (1) the two scents differed from each other in terms of pleasantness and (2) scent inconsistency alone had a negative effect on perceived pleasantness. Sixty women were told that they were smelling either a pine scent or a floral scent (expectations: floral or pine) and then given one of the two actual scents to sample (actual scent: floral or pine). The scents were evaluated by the same measures as those used in our main experiment. The overall two by two ANOVA was not significant ( $F=1.47$ ,  $p=.23$ ), and none of the main or interaction effects were significant at  $p<.05$ . Those results suggest no differences in the perceived pleasantness of the two scents, and also that a simple "expectation disconfirmation" hypothesis does not explain the differences in odor pleasantness reported by the subjects in our study. Perhaps the mood change observed in the main experiment is necessary if we are to observe an effect of scent fit on perceived pleasantness.

Finally, the scent consistency manipulation check was added as a potential covariate for the overall MANOVA model reported in Table 3. If scent consistency and scent pleasantness are confounded, one would expect the two covariates to operate similarly when entered into the model. Scent consistency is a mediator when used as the only covariate; however,

when all potentially significant covariates are entered into the model (positive mood, scent pleasantness, support arguments, and scent consistency) the scent consistency measure is no longer significant ( $b=.09$ ,  $t=.84$ ,  $p=.41$ ). Those findings show that scent consistency effects are fully accounted for by the scent consistency manipulation, but scent pleasantness effects are not because the measure continues to be significant. The analysis is further evidence that the two are not confounded.

A scent used in an ad for novelty might make particular sense when consumers are expected to have low motivation to process. We found no effect of cue fit on attitudes for subjects with lower motivation. Though attitudes were not affected, did the addition of the cue increase attention among less motivated individuals? Scratching and sniffing the panel does appear to have affected reported motivation to process. In the lower motivation condition, the mean score on motivation was higher for subjects who scratched and sniffed (20.18) than for those who did not (15.67) ( $F=5.64$ ,  $p=.02$ ,  $\eta^2=.08$ ). However, those scores are well below the mean motivation score of subjects exposed to the higher motivation treatment (28.54).

Researchers need to examine in greater depth how the presence of a positive scent enhances attitudes over those formed in a no-scent condition, or whether the effects reported in the literature are simply a function of negative odors. Note that the results in the two control conditions do not differ from those in the floral-scent condition for Aad. The results for the higher motivation unscented panel control group are difficult to explain. If there were a placebo effect, one would expect many of the subjects to report a "false alarm" floral smell. That was not the case, however, as only three of the 14 subjects stated that the scent was floral. We note that the subjects in the no-scent condition felt the scent was of poorer fit than the subjects exposed to the floral scent, but did not experience the negative mood state that the subjects exposed to the pine scent experienced. That finding is again evidence that the mood shift may be in part physiological and is a critical mediator for understanding how olfactory cues in advertising affect attitudes.

Another issue for further investigation is whether and how cognition is affected by scent. We used four different measures of cognition to triangulate on cognitive processing. However, those measures did not tap the actual thoughts occurring at the time of ad processing. Researchers might use a verbal stream-of-consciousness technique to investigate further the cognitive associations and processes.

In our investigation, all effects of scent on Ab were mediated by Aad. Perhaps in other contexts an odorant used in an advertisement could directly influence Ab. For instance, Miniard, Bhatla, and Rose (1990) found that nonclaim cues (i.e., pictures) could influence both Aad and Ab among subjects who had low motivation to process but that the Ab effect was not significant under higher motivation conditions. Those findings suggest that the picture was operating as a peripheral cue for higher motivation subjects and a central cue for the lower-motivation subjects. Perhaps if the odor used were a product sample, such as a new air-freshener scent, scent would have direct effects on Ab. Indeed, it is likely that we failed to find a direct effect of scent on Ab because a key executive element that we manipulated may have provided little additional information about the product.

Our results demonstrate that no-odor control groups are essential. Had we not included a no-scent group to control for the act of scratching and sniffing and the no-panel group, we might have concluded erroneously that the better-fitting odor enhanced attitudes. Instead we found that, in the higher-motivation-to-process condition, the no-scent group and the no-panel group were equivalent to the floral group on Aad and the lack of fit in the pine condition was what affected attitudes.

Though we found that the addition of a scent did not necessarily improve consumers' attitudes, such changes may occur when the cue provides additional product-relevant information rather than redundant information. The inclusion of olfactory cues may be worth the time, effort, and cost in those instances. In fact, expectancy/disconfirmation theory may be a useful approach for addressing the issue of scent in advertising when scent is a primary characteristic of a product (such as perfumes and colognes.) Perhaps we did not observe a more positive attitude when the floral scent was used because the scent confirmed, rather than exceeded, expectations. In other contexts, more positive Aad and in turn more positive Ab may result if the scent exceeds expectations—for example, if cologne smells better than expected. Such a model would be inappropriate, however, for examining scent fit because the fit is unlikely to be "better fitting than expected"—positive disconfirmation would not be possible.

Our research suggests that using a poor-fitting scent for the novelty value can be detrimental. The answer to the question "Does it matter if it smells?" in our particular context is "Yes, but only if the advertiser makes a 'poor' choice!"

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